

CLAIMS

1. A tracking solar collector of the type comprising a series of supports oriented on a generally north-south axis; a torsion tube, having a torsion tube axis, rotatably mounted to the supports to permit rotation of the torsion tube about the torsion tube axis; a torsion tube rotator operably coupled to the torsion tube so to rotate the torsion tube between morning, noontime and evening angular orientations; and solar panels, each having a center of gravity, the improvement comprising:

mounting structure securing the solar panels to the torsion tube at a chosen angle to the torsion tube axis.

2. The solar collector according to claim 1 wherein each of the solar panels is located entirely vertically above the torsion tube axis when the torsion tube is at the noontime angular orientation.

3. The solar collector according to claim 1 wherein the mounting structure further comprises:

first and second plates, each said plate having a generally triangular torsion tube portion, located on opposite sides of the torsion tube;

an elongated, generally rectangular solar panel portion extending at an angle from the torsion tube portion; and

fasteners extending through or around the torsion tube portions and the torsion tube therebetween.

4. A tracking solar collector assembly comprising:

first and second Southside supports;

first, second and third North side supports;

the Southside supports and the North side supports defining first and second generally parallel paths;

first and second solar collector support structures, each solar collector support structure having first and second spaced apart pivotal support points, said first and second support points defining a tilt axis;

at least one solar collector mounted to each solar collector support structure;

the first support points of the first and second solar collector support structures pivotally connected to and supported by the first and second Southside supports, respectively;

the second support point of the first solar collector support structure pivotally connected to and supported by the first and second North side supports;

the second support point of the second solar collector support structure pivotally connected to and supported by the second and third North side supports; and

a tilting assembly comprising:

a drive element secured to each solar collector support structure;

a drive element coupler operably coupling the drive elements, the drive elements and the drive element coupler creating a drive assembly; and

a driver coupled to the drive assembly so that operation of the driver causes the drive elements move in unison thus causing the solar collector support structures and the solar collectors therewith to tilt in unison.

5. The assembly according to claim 4 wherein at least one tilt axis is at an angle to a horizontal line.

6. The assembly according to claim 5 wherein said angle is between about 15° to 30°.

7. The assembly according to claim 5 wherein said support element is a variable-length support element to permit said angle to be changed.

8. The assembly according to claim 4 wherein the first and second paths are generally East-West paths.

9. The assembly according to claim 4 wherein the drive element is secured to each solar collector support structure at a point between the first and second support points.

10. The assembly according to claim 4 wherein a plurality of said solar collectors are mounted to the solar collector support structures.

11. The assembly according to claim 10 wherein the solar collectors define an array of solar collectors having generally parallel lateral sides.

12. The assembly according to claim 4 wherein the solar collector comprises a PV module.

13. The assembly according to claim 4 wherein the first and second Southside supports are generally vertically aligned with the tilt axes of the first and second solar collector support structures, respectively.

14. The assembly according to claim 4 wherein the second North side support is positioned laterally between the tilt axes of the first and second solar collector support structures.

15. The assembly according to claim 4 wherein the second North side support is positioned laterally midway between the tilt axes of the first and second solar collector support structures.

16. The assembly according to claim 4 wherein the first, second and third North side supports each include a base securable to a support surface, each base laterally offset from the tilt axes of the first and second solar collector support structures.

17. The assembly according to claim 16 wherein the base of the second North side support is positioned at a position laterally midway between the tilt axes of the first and second solar collector support structures.

18. The assembly according to claim 4 wherein each North side support comprises a base, mountable to a support surface, and at least one support element connecting the base to a second support point.

19. The assembly according to claim 18 wherein the base of the second North side support is positioned generally equidistant from the second support points of the first and second solar collector support structures.

20. The assembly according to claim 18 wherein said support element is a fixed-length support element.

21. The assembly according to claim 4 further comprising a fourth North side support, and wherein:

the second support point of the first solar collector support structure is pivotally connected to and supported by the first, second and third North side supports; and

the second support point of the second solar collector support structure is pivotally connected to and supported by the second, third and fourth North side supports.

22. The assembly according to claim 21 wherein the second support point of the first solar collector support structure is connected to the first and third North side supports by tension struts and to the second North side support by a compression strut.

23. The assembly according to claim 22 said wherein the tension struts comprise cables and the compression strut comprises a post.

24. The assembly according to claim 22 wherein the compression strut is vertically aligned with the tilt axis of the first solar collector support structure.

25. The assembly according to claim 4 wherein the solar collector support structure comprises a torque tube extending along the tilt axis.

26. The assembly according to claim 25 wherein the solar collector support structure comprises module rails secured to the torque tube and extending laterally from the torque tube.

27. A tracking solar collector installation comprising a tracking solar collector assembly according to claim 4 mounted to a support surface.

28. The installation according to claim 27 wherein the support surface comprises the ground.
29. The installation according to claim 28 wherein the ground is unpaved.
30. The installation according to claim 27 wherein the support surface comprises a roof.
31. The installation according to claim 27 wherein the support surface comprises a reservoir cover.
32. The installation according to claim 4 wherein a plurality of solar collectors are mounted to the solar collector support structures, said plurality of solar collectors defining a gap between the solar collectors, the gap extending perpendicular to the tilt axis.
33. The installation according to claim 32 wherein at least one of the North side supports comprises laterally extending support elements extending generally perpendicular to the tilt axes and aligned with the gap so that tilting the solar collector support structures and the solar collectors therewith causes the laterally extending support elements to pass through the gap.
34. The installation according to claim 33 wherein the laterally extending support elements comprise struts.
35. The installation according to claim 34 wherein the struts comprise flexible cables.
36. The installation according to claim 34 wherein the struts comprise rods.